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calculating transform parameters for said selected portion of said image, said calculated transform parameters being used to control said transformation of the digitised signal to generate said output signal.

REMARKS

Claims 36-44 have been cancelled, and claims 45-73 have been added. The amendments are being made for business reasons to mirror the patent claims recently granted in European Patent No. EP 0971540 B1. Accordingly, the amendments are not being made for reasons relating to patentability. The amendments are fully supported by the specification, claims, and figures as originally filed. No new matter is believed or intended to be involved. In accordance with 37 CFR 1.121, attached is mark-up version of the changes made in the present amendment captioned "Marked-Up Version of Claims".

The claims 46-72 mirror the claims in EP 0971540 B1 granted on June 26, 2002, however, the claims have eliminated any multiple dependency between the claims. The present application and EP 0971540 B1 both claim priority to the same US application, namely, application no. 07/699,366 filed on 5/13/91 (now Patent No. 5,185,667). While the grant of a corresponding European Patent is not binding on the US Patent and Trademark Office, the Applicants submit that this recent grant from the EPO for virtually identical claims is highly persuasive evidence that claims 45-72 are allowable in their present form.

Claim 73 is very similar to pending claim 57 but recites additional limitations, including the limitation of a "spherical image comprising two images captured with a fisheye lens" as recited in the claim. Accordingly, claim 73 is narrower than claim 57 and should also be in a condition for allowance.

The rejections under 35 USC §102 in the Office Action based on Kamejima are now moot, as those claims have all been cancelled. While Applicants have cancelled such claims, the cancellation is not and should not be considered an acquiescence by Applicants of the merits of the rejections. Indeed, numerous elements of the cancelled claims did not have corresponding structure or steps in Kamejima, nor was a prima facie case of obvious established pursuant to MPEP § 2142. Applicants have simply substituted the granted claims in the related EP Patent into the present applicant to expedite allowance and to obtain parallel patent protection in the United States. Accordingly, Applicants reserve all rights to with respect to the cancelled claims.

Based on the foregoing, all pending claims are in a condition for allowance. All pending claims overcome the rejections presented in the Office Action, and Applicants respectfully request reconsideration and an early notice of allowance.

Respectfully Submitted,

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Marked-Up Version of Claims

Please cancel claims 36-44, without prejudice.

45. (New) A system for providing perspective corrected views of a selected portion of a received optical image captured using a wide angle lens, the received optical image being distorted, the system comprising:

image capture means for receiving signals corresponding to said received optical image and for digitising said signal;

input image memory means for receiving said digitised signal;

input means for selecting a portion of said received image to view;

image transform processor means for processing said digitised signals to produce an output signal corresponding to a perspective corrected image of said selected portion of said received image;

output image memory means for receiving said output signal from said image transform processor means; and

output means connected to said output image memory means for recording or displaying said perspective corrected image of said selected portion;

characterised in that said image transform processor means comprises transform parameter calculation means for calculating transform parameters for said selected portion of said image and processes said digitised signal based on said calculated transform parameters to generate said output signal.

46. (New) A system according to claim 45, comprising a camera imaging system for receiving said optical image and for producing said signals corresponding to said received optical image for output to said image capture means.

47. (New) A system according to claim 46, comprising wide angle lens means mounted on said camera imaging system for producing said optical image for optical conveyance to said camera imaging system.

48. (New) A system according to claim 47, wherein said lens means is one or more fish-eye lenses.

49. (New) A system according to claim 45, wherein said input means provides for input to said image transform processor means of one or more of: a direction of view; tilting of a viewing angle; rotation of a viewing angle; pan of said viewing angle; focus of said image and magnification of the selected portion of the image.

50. (New) A system according to claim 49, wherein tilting of said viewing angle through at least 180 degrees is provided for.

51. (New) A system according to claim 49, wherein rotation of said viewing angle through 360 degrees is provided for.

52. (New) A system according to any one of claims 49, wherein pan of said viewing angle through at least 180 degrees is provided for.

53. (New) A system according to claim 52, wherein pan of said viewing angle through 360 degrees is provided for.

54. (New) A system according to claim 45, wherein said input means is a user-operated manipulator switch means.

55. (New) A system according to any one of claims 45, wherein said input means is a signal from a computer input means.

56. (New) A system according to claim 45, wherein said image transform processing means is programmed to implement the following two equations:

$$x = \frac{R\{uA-vB+mR\sin\beta\sin\delta\}}{\sqrt{u^2+v^2+m^2R^2}}$$

$$y = \frac{R\{uC-vD+mR\sin\beta\sin\delta\}}{\sqrt{u^2+v^2+m^2R^2}}$$

where:

$$A = (\cos\phi\cos\delta - \sin\phi\sin\delta\cos\beta)$$

$$B = (\sin\phi\cos\delta + \cos\phi\sin\delta\cos\beta)$$

$$C = (\cos\phi\sin\delta + \sin\phi\cos\delta\cos\beta)$$

$$D = (\sin\phi\sin\delta + \cos\phi\cos\delta\cos\beta)$$

and where:

R = radius of the image circle
β = zenith angle
δ = Azimuth angle in image plane
ϕ = Object plane rotation angle
m = Magnification
u,v = object plane coordinates
x,y = image plane coordinates

57. (New) A method for providing perspective corrected views of a selected portion of an optical image captured with a wide angle lens, the received optical image being distorted, the method comprising:

providing a digitised signal corresponding to said optical image;

selecting a portion of said optical image;

transforming said digitised signal to produce an output signal corresponding to a

perspective corrected image of said selected portion of said received image; and

displaying or recording said perspective corrected image of said selected portion;

characterised in that said step of transforming said digitised signal comprises calculating transform parameters for said selected portion of said image, said calculated transform parameters being used to control said transformation of the digitised signal to generate said output signal.

58. (New) A method according to claim 57, comprising first receiving said optical image, producing signals corresponding to said received optical image and digitizing said signals.

59. (New) A method according to claim 57, comprising capturing said optical image with one or more fish-eye lenses.

60. (New) A method according to any one of claims 57, wherein said step of selecting the portion of the image to view comprises selecting one or more of: a direction of view; tilting of a viewing angle; rotation of a viewing angle; pan of said viewing angle; focus of said image and magnification of the selected portion of the image.

61. (New) A method according to claim 60, wherein tilting of said viewing angle through at least 180 degrees is provided for.

62. (New) A method according to claim 60, wherein rotation of said viewing angle through 360 degrees is provided for.

63. (New) A method according to any one of claims 60, wherein pan of said viewing angle through at least 180 degrees is provided for.

64. (New) A method according to claim 63, wherein pan of said viewing angle through 360 degrees is provided for.

65. (New) A method according to any one of claims 57, wherein selection of said portion of the image to view is achieved using a user-operated manipulator switch means.

66. (New) A method according to any one of claims 57, wherein selection of said portion of the image to view is controlled by a signal from a computer input means.

67. (New) A method according to any one of claims 57, wherein said image transformation implements the following two equations:

$$x = \frac{R\{uA-vB+mR\sin\beta\sin\delta\}}{\sqrt{u^2+v^2+m^2R^2}}$$

$$y = \frac{R\{uC-vD+mR\sin\beta\sin\delta\}}{\sqrt{u^2+v^2+m^2R^2}}$$

where:

$$A = (\cos\phi\cos\delta - \sin\phi\sin\delta\cos\beta)$$

$$B = (\sin\phi\cos\delta + \cos\phi\sin\delta\cos\beta)$$

$$C = (\cos\phi\sin\delta + \sin\phi\cos\delta\cos\beta)$$

$$D = (\sin\phi\sin\delta + \cos\phi\cos\delta\cos\beta)$$

and where:

R = radius of the image circle
β = zenith angle
δ = Azimuth angle in image plane
ϕ = Object plane rotation angle
m = Magnification
u,v = object plane coordinates
x,y = image plane coordinates

68. (New) A method according to any one of claims 57, wherein a plurality of portions of said image are selected for viewing and are displayed either simultaneously or consecutively.

69. (New) A method according to any one of claims 57, wherein the image is viewed interactively by repeating the steps of selecting, transforming and displaying said portion of the image.

70. (New) A method according to claim 57, wherein said step of transforming the image is based on lens characteristics of the wide angle lens.

71. (New) A method according to claim 70, wherein the step of transformation is based on azimuth angle invariability and equidistant projection.

72. (New) A method according to claim 57, wherein the step of transforming the image is performed at real time video rates.

73. (New) A method for providing perspective corrected views of a selected portion of a spherical image comprising two images captured with a fisheye lens, the received spherical image being distorted, the method comprising:

providing a digitised signal corresponding to said spherical image;

selecting a portion of said spherical image;

transforming said digitised signal to produce an output signal corresponding to a perspective corrected image of said selected portion of said spherical image; and

displaying or recording said perspective corrected image of said selected portion;

characterised in that said step of transforming said digitised signal comprises calculating transform parameters for said selected portion of said image, said calculated transform parameters being used to control said transformation of the digitised signal to generate said output signal.